

Integrated Resource Planning, the Basis for Regional Water Management Water Plan Update 2005; Volume 1; Chapter 2; Box 2-3

Overview

Integrated resource planning is a comprehensive approach to resource management and planning that emerged in the late 1980s in the electric power industry. As applied to water management, integrated resource planning is a systems approach that explores the cause-and-effect relationships affecting water resources wherever the planning entity's operations affect water use, quality, and supply. The process analyzes all the interrelated water management components in a given region. The focus is on the interrelation of the different water management components with the understanding that changes in the management of one component will affect the others. Because these components are often not confined to the boundaries of a single water management agency, a consensus-based, cross-jurisdictional, regional approach may be required to formulate comprehensive, win-win solutions to identified problems.

The overriding goals of the process are to ensure reliable, affordable, good quality water from a diversity of sources; and design a comprehensive plan that achieves water supply reliability and quality objectives but allows planned programs to adapt to changes in environmental, institutional, and socioeconomic conditions. By its nature, integrated resource planning is technical and political because a plan for managing water resources in any basin affects ecosystems; socioeconomic systems; and water storage, treatment, and conveyance systems. Integrated resource planning identifies the appropriate mix of demand-side and supply-side management components (for example, urban water conservation, agricultural water conservation, water reuse and recycling, water transfers, conjunctive use, expanded conveyance flexibility, and new groundwater and surface water storage) that are expected to provide long-term, reliable water service and maximize benefits at the lowest reasonable cost. The process is employed to:

- evaluate the current state of water resources in a watershed or region;
- determine the variety of current and future demands for water and how demand, quality, and supply patterns are affecting land use, fish and wildlife resources, and local and regional economies; and
- balance demand management and supply enhancement options to produce a comprehensive, adaptive water management plan that specifies long-term goals, objectives, and programs to provide sustainable water uses in a basin.

When integrated resource planning is applied rigorously, it considers all competing needs and identifies the different resource management strategies that the planning entity can employ (See Volume 2 for a discussion of 25 resource management strategies). Integrated resource planning evaluates various response packages, which are different mixes of resource management strategies used to manage water resources over a designated planning horizon, and indicates when and under what future conditions a management strategy would be added or changed. The costs (socioeconomic and environmental) of employing each response package are also derived during the planning process.

Selecting the timing of adding or changing individual strategies to a region's management response requires completion of a risk analysis. The risk analysis takes into account the expected frequency and severity of not meeting current and future water demands; how additional water management strategies are likely to affect that frequency and severity; and how available contingency measures can reduce the impact of shortages when they occur.

Integrated resource planning includes many elements of traditional planning. It also includes thorough analyses of water use efficiency programs, levels of uncertainty acceptable to the planning entity, and coordinated efforts to involve the public in the planning process. Integrated resource planning is multi-objective planning that recognizes decisions must balance competing objectives in a sustainable way. Integrated resource planning often includes the following activities:

- Define planning objectives and associated evaluation criteria (see Chapter 4 for suggested criteria). The objectives must be specific and the criteria measurable, so they can be used to evaluate alternative response packages.
- Involve the appropriate constituencies. The level and breadth of involvement will vary depending on local area needs and the level of interest in the resource strategies being considered.
- Assess demand-reduction strategies such as agricultural and urban water conservation. These strategies must be identified and analyzed in the same multi-tiered way that supply-side strategies are analyzed.
- Assess operational efficiency and supply redistribution strategies such as conveyance, system operation, and water transfers.
- Assess supply augmentation strategies such as conjunctive management, water recycling, desalination, and storage.
- Assess water quality management strategies such as drinking water treatment, groundwater/aquifer remediation, pollution prevention, and runoff management.

- Assess resource stewardship strategies such as agricultural land stewardship, urban land use management, ecosystem restoration, floodplain management, and watershed management.
- Formulate and evaluate different response packages. The resource management strategies selected from the above activities are combined into alternative response packages (25 strategies are described in Volume 2). Each response package then goes through multilevel screening using approved evaluation criteria, until (one to three) responses emerge that best meet the planning objectives and evaluation criteria. Each response package (mix of strategies) must explicitly demonstrate the tradeoffs among the different evaluation criteria. Often, a decision analysis method must be approved before screening the individual resource management strategies and the response packages.

Guiding Principles

Use a broad, long-term perspective. Use a comprehensive stakeholder-based planning process to (1) promote multi- objective planning with a regional focus, (2) emphasize both local and regional initiatives, (3) recognize distinct regional problems and resources, and (4) emphasize long-term planning (30-50 year planning horizon).

Identify broad benefits, costs, and tradeoffs. Evaluate programs and projects recognizing economic growth, environmental quality, and social equity as co-equal objectives. Based on this comprehensive assessment, determine potential economic, environmental, and social benefits, beneficiaries, costs, and tradeoffs and include a plan to avoid, minimize, and mitigate for adverse impacts.

Promote sustainable resource management. Promote the wise use of all natural resources to ensure their availability for future generations. This can be done by promoting activities with the greatest benefit for the entire region and activities that consider the interrelationship between regional water supplies, water quality, water infrastructure, flood protection, recreation, land use, economic prosperity, and the environment.

Increase regional self-sufficiency. Increase regional self-sufficiency by considering activities that reduce the need to import water from another hydrologic region, particularly during times of limited supply availability such as during a drought or after a catastrophic event like an earthquake.

Increase regional drought preparedness. Evaluate and implement strategies that among other benefits would reduce the impacts of drought in the region. In California, drought contingency planning is an important component of regional water planning. Examples of such strategies include water use efficiency and recycled municipal water, system

reoperation, conjunctive management and groundwater storage, surface storage (CALFED and regional), and ocean and brackish water desalination.

Promote environmental justice. All projects sponsored by or partnered with the State, or using public funds must promote environmental justice, which is the fair treatment of people of all races, cultures, and incomes with respect to the development, funding and implementation of resource management projects.

Promote coordination and collaboration among local agencies and governments. Promote and improve coordination and collaboration among local agencies and governments within a region, particularly those that are involved in activities that might affect the long-term sustainability of water supply and water quality within the region. Regional planning should include a public review process with open and transparent decision-making, as well as education and outreach for public, stakeholders, and decision-makers.

Use sound science, best data, and local knowledge. Use the best available data and information and, when possible, use planning methods and analytical techniques that have undergone scientific review.